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Ceramic Joining Symposium

CONVENTIONAL AND MICROWAVE JOINING OF
SILICON CARBIDE USING DISPLACEMENT REACTIONS

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Microwave heating was used to join Silicon Carbide rods using a thin **TiC/Si** tape interlayer. A 40 lb. compressional force was applied to the rods during the joining process. The volumetric heating associated with the microwaves quickly heated the **SiC rods and tape to $\approx 600 - 900^\circ\text{C}$** where solid state displacement reactions between Si and **TiC** occurred. Only 200 watts were required to join the samples within 5 minutes in a rectangular microwave cavity excited in a TE₁₀₂ mode. SEM micrographs and measurements of the structural integrity of the joints will be presented. The quality of the microwave processed joints will also be compared to SiC joints obtained by conventional heating techniques. [Work partially supported by NASA]